

**Final
Site-Specific Safety and Health Plan Attachment
For Training Area T-24A, Former Chemical
Munitions Disposal Area, Parcel 187(7);
Former Machine Gun Range, Parcel 112Q; Former Demolition
Area, Parcel 113Q-X; Former Bandholtz Machine Gun
Qualifying Range, Parcel 213Q; and
Former Bandholtz Field Firing Range, Parcel 214Q**

**Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887**

September 2000

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Training Area T-24A at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Bill Hetrick, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Training Area T-24A at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.

Site Coordinator

Date

Site-Specific Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities for the Training Area T-24A at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

DateThis image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
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Fort McClellan Project Emergency Contacts

Fire Department (on post)	911
Fire Department (off post)	(256) 237-3541
Ambulance (off post)	911
Regional Medical Center	(256) 235-5121
Military Police (SSG Busch).....	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton)	(256) 848-5680, 848-4732
Anniston Police Department	(256) 238-1800
Chemical Agent Emergencies	(256) 895-1598
(Ken Barnett, CEHNC)	cell phone (256) 310-0604
UXO Emergencies	(256) 895-1598
(Ken Barnett, CEHNC)	cell phone (256) 310-0604
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
Baltzell Gate Guard Shack (Staffed 1600-0700 hours, Mon-Sun)	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management.....	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(770) 663-1429
Bill Hetrick, IT H&S Manager.....	(865) 690-3211
Mike Moore, Fort McClellan Safety Officer	(256) 848-5433
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

See Attachment 1 of the Site-Specific Field Sampling Plan for the list of Abbreviations and Acronyms.

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples at the Training Area T-24A.

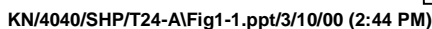
Project Tasks

- Conduct a surface and near surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling activity to determine the presence of potential downhole hazards.
- Install 19 groundwater monitoring wells (9 residuum and 10 bedrock wells).
- Collect 29 surface soil samples, 8 subsurface soil samples, 37 monitoring well water samples (collected from 18 existing and 19 proposed monitoring wells), 7 surface water samples, and 7 sediment samples.

Personnel Requirements. Up to 15 employees. See Figure 1-1 for an organization chart.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP. This site-specific safety and health plan must be used in conjunction with the SHP, FTMC, Alabama.

**Organization Chart
Training Area T-24A
Savannah Task Order #CK10
Fort McClellan
Contract #DACA21-96-D-0018**



2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

Training Area T-24A, Former Chemical Munitions Disposal Area, Parcel 187(7), is within Range 24 Multi-Purpose Range, Parcel 108(7)/82Q-X located on the southeastern area of the FTMC Main Post. This site occupies approximately 1.5 acres and is located near the center of Range 24A. The area is fenced and posted. This former chemical munitions disposal training site was used from an unknown date until 1973. Training sites within the parcel included two square burning pits measuring approximately 16 by 16 feet. Training activities conducted here reportedly included disposal of chemical warfare munitions filled with phosgene, 3-quinuclidinyl benzilate, sarin, and distilled mustard.

The Former Machine Gun Range (Parcel 112Q) is located at the western end of current Range 24A. The dates of use and types of ordnance fired at this range are unknown, but the range appears on a 1959 map. No other information is available. The Former Demolition Area (113Q-X) is located in the central portion of the current Range 24A and includes most of the former Chemical Munitions Disposal Area, Parcel 187(7). The dates of use and types of activities that occurred here are unknown, but this area is also identified as a demolition area on a 1959 map.

A map titled "Ranges, 1948" identifies a range in the southeast area of the Main Post as the Former Bandholtz Machine Gun Qualification Range (Parcel 213Q) and shows the approximate location of the current Range 24A. The direction of fire is toward the east and the surface danger zone is displayed on the map. Ordnance fired at this range is assumed to have been restricted to small arms. This location has been the site of several other ranges during the history of FTMC. No other information is available regarding the Former Bandholtz Machine Gun Qualification Range, dates of use, or operation.

Range 24A, Multi-Purpose Range, Parcel 108(7)/82Q-X, formerly contained two range operations buildings, a fog oil drum storage site (Parcel 88[6] addressed in another work plan), a smoke generator and maintenance line, the former chemical munitions disposal (addressed in this SSHP), and several ranges that were once included within Range 24A or were a part of Range 24A. One 500-gallon steel aboveground heating oil tank was located at the two range operation buildings at the west end of Range 24A. Range 24A covers approximately 48 acres.

This range was used for smoke, demolition, and field flame expedient training. Tracer (white phosphorus) or sulfur materials may be present. Materials for field flame expedient (fog oil [diesel/motor gas]) were historically stored in 55-gallon drums and are used at this range. This was a U.S. Army Chemical School range. Mortar rounds were found nearby during aborted efforts to construct a dam.

Long-time FTMC personnel report that a submachine gun range was located in this area in the early 1960s. These FTMC personnel report that numerous berms are present in the area of Range 24A; this information is confirmed by historical maps. The oldest annotation of this range on a map identifies Range 24A as a rifle range. Another map identifies the firing points for a machine gun range and an explosive ordnance disposal area within the current boundary of Range 24A (ESE, 1998).

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Training Area T-24A. Contaminants of concern at the area include arsenic, benzene, ethyl benzene, lead, pentachlorophenol, phenol, toluene, and xylene.

Prior to IT conducting site operations at Training Area T-24A, the area will be inspected and cleared for chemical warfare agents. Based on this clearance, monitoring for chemical warfare agents will not be conducted.

The possibility of UXO exists at the Training Area T-24A; therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at the Training Area T-24A. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-24A
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 4)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Sour ce ^e	IDLH (NIOSH) ^f
Acetone [67-64-1]	9.7	13B100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Arsenic [7440-38-2]	NA	NA	Inh Ing Con Abs	Ulceration of nasal septum, dermatitis, GI disturbances, respiratory irritation, hyperpigmentation of skin.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.01 mg/m ³ 0.01 mg/m ³ --	-- -- C 0.002 mg/m ³	PEL TLV REL	Ca (5 mg/m ³)
Benzene [71-43-2]	9.24	?	Inh Ing Con Abs	Irritated eyes, skin, nose, respiratory system, giddiness, headache, nausea, dermatitis, bone marrow depression.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm 0.5 ppm 0.18 ppm	5 ppm 2.5 ppm 1 ppm	PEL TLV REL	Ca (500 ppm)
Ethyl benzene [100-41-4]	8.76	?	Inh Ing Con	Irritated eyes, skin, mucous membranes, headache, dermatitis, narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm	PEL TLV REL	800 ppm
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; broncho- pneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-24A
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Sour ce ^e	IDLH (NIOSH) ^f
n-Hexane [110-54-3]	10.18	65B248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43B200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Lead [7439-92-1]	NA	NA	Inh Ing Con	Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	0.05 mg/m 0.05 mg/m 0.1 mg/m		PEL TLV REL	100 mg/m
Methyl ethyl ketone [78-93-9]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention		500 ppm 500 ppm 500 ppm	PEL TLV REL	
Nitric acid [7697-37-2]	11.95	0.3B1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	200 ppm

Table 2-1
Toxicological and Physical Properties of Chemicals
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Sour ce ^e	IDLH (NIOSH) ^f
Pentachlorophenol [87-86-5]	NA	?	Inh Ing Con Abs	Irritated eyes, nose, throat, sneezing, coughing, weakness, vomiting, headache, dizziness, dermatitis, chest pain, high fever, dyspnea.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin)	-- -- --	TLV PEL REL	2.5 mg/m ³
Phenol [108-95-2]	8.50	?	Inh Ing Abs Con	Irritated eyes, nose, throat, anorexic, weakness, pain, dark urine, skin burns, dermatitis, tremors.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention	5 ppm (skin) 5 ppm (skin) 5 ppm (skin)	-- -- C 15.6 ppm	TLV PEL REL	250 ppm
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m ³ 10 mg/m ³ / total dust 5 mg/m ³ respirable fraction	TLV PEL REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C 2 mg/m ³ C 2 mg/m ³ C 2 mg/m ³	PEL TLV REL	250 mg/m ³
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m ³ 1 mg/m ³ 1 mg/m ³	3 mg/m ³	PEL TLV REL	80 mg/m ³
Toluene [108-88-3]	8.82	?	Inh Ing Con Abs	Irritated eyes, nose, fainting, weakness, confusion, dizziness, headache, dilated pupils, dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	200 ppm 50 ppm (skin) 100 ppm	C 300mg/m ³ -- 150 ppm	PEL TLV REL	500 ppm
Xylene (CO, m, p isomers) [95-47-6] [108-38-3] [106-42-3]	8.56	?	Inh Ing Con Abs	Irritated eyes, skin, nose, throat, dizziness, excitement, drowsiness, incoherence, staggering, nausea, vomiting, dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	-- 150 ppm 150 ppm	TLV PEL REL	900 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals

Training Area T-24A

Fort McClellan, Calhoun County, Alabama

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^aIP = Ionization potential (electron volts).

^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.

^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

^ePEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit valueXTWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

^fIDLH (NIOSH)XImmediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.

Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.

Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.

Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.

Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.

Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.

Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.

Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.

Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.

National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.

Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.

Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.

Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.

Warning Properties of Industrial ChemicalsXOccupational Health Resource Center, Oregon Lung Association.

Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

2.2 General Site Information

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater and soils.

Site Topography. The elevation at this site ranges from approximately 985 feet to 1,145 feet, with the ground surface sloping from the southeast to the northwest across the site. A small creek that bisects the site flows north along a small valley to the South Branch of Cane Creek.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*
Install monitoring wells	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results for volatile organic hydrocarbons in the worker=s breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet and a face shield.

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health-approved full-face, air-purifying respirators equipped with organic vapor/acid gas/P100 cartridge
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet and a face shield.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Training Area T-24A operations are arsenic, benzene, ethyl benzene, lead, pentachlorophenol, phenol, toluene, and xylene. Table 4-1 contains action levels for site monitoring at the sites.

Chemical. Monitoring will be performed by the site safety and health officer during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the work areas and BZs to determine if any combustible/flammable oxygen levels may be present that would necessitate evacuation of the work area. Benzene detector tubes will be utilized, as needed, to monitor benzene levels in the work areas and BZs. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

Unexploded Ordnance. UXO safety will be achieved by employing UXO specialists to ensure that field personnel do not come into contact with UXO. In areas where UXO is suspected to exist, the UXO specialists will perform the following UXO avoidance operations.

- **Area UXO Surveys Using Magnetometers.** During this operation UXO on the surface will be detected and marked for avoidance during field operations. Metal objects just below the surface (within 2 feet) will also be marked to indicate the potential hazard.
- **Downhole UXO Surveys.** UXO specialists will perform downhole magnetometer surveys to detect metal objects in the path of the boring apparatus until undisturbed soils are reached. The boring location will be moved if subsurface metal objects are detected.

If UXO is encountered, personnel will contact the site manager and UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

Table 4-1
Action Levels
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action ^a
Volatile Organic Hydrocarbons (VOH)	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
Oxygen	$\geq 20\%$, $\leq 23\%$ $< 20\%$, $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area

When in Level D Modified/D PPE

Analyte	Action Level	Required Action ^b
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Oxygen	$\geq 20\%$, $\leq 23\%$ $< 20\%$, $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.
Benzene	≥ 1 ppm in BZ	Upgrade to Level C PPE.

Table 4-1
Action Levels
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Training Area T-24A
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Land Survey	OV Monitor	Initially for area	BZ of employees
Sampling (water, sediment, and soil)	OV Monitor LEL/O ₂ Monitor BDT	Continuously Continuously As needed	BZ of employees and/or work area
Installing monitoring wells	OV Monitor LEL/O ₂ Monitor BDT	Continuously Continuously As needed	BZ of employees and/or work area

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

BDT = Benzene detector tube.

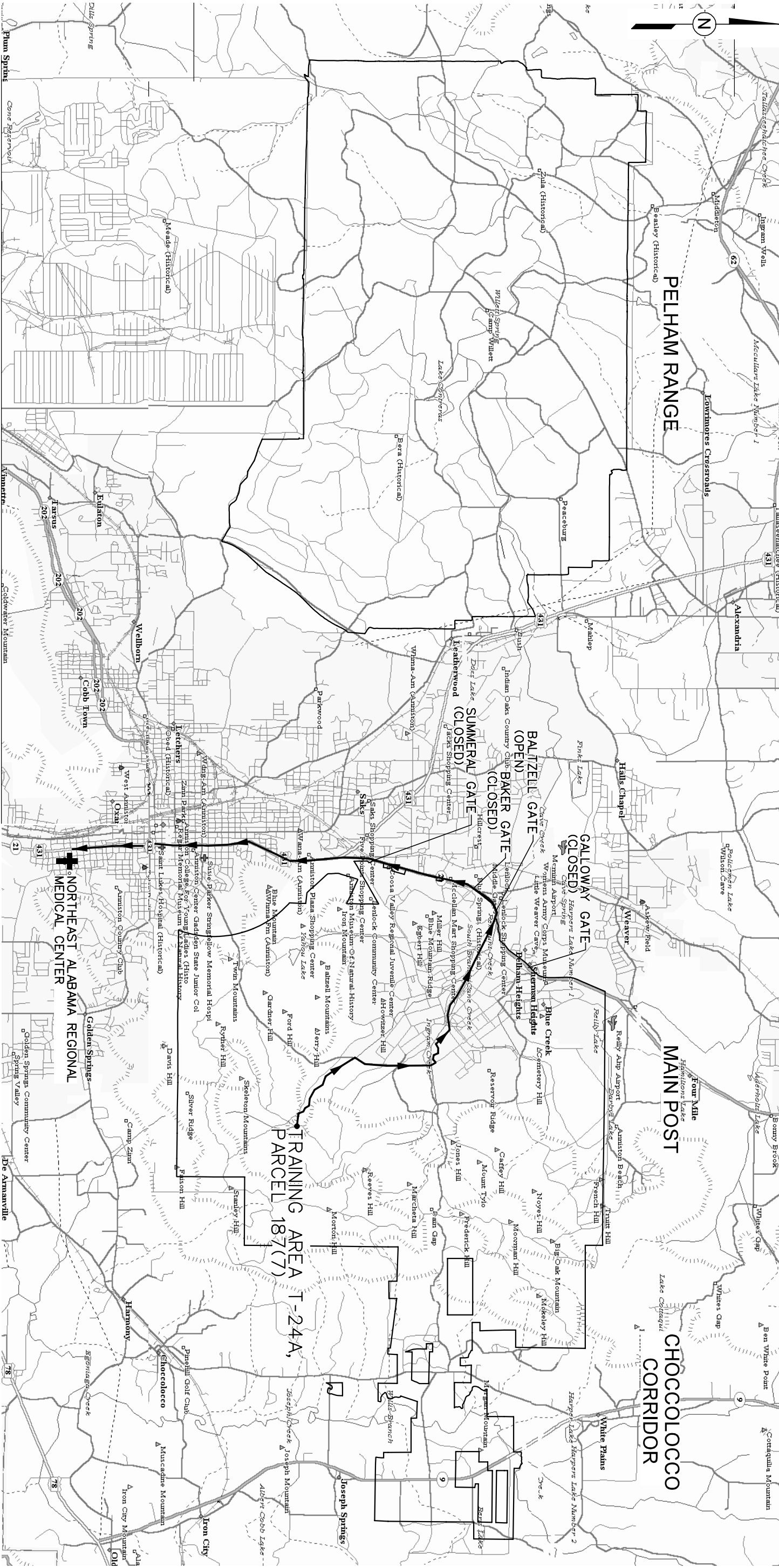
5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Land survey
- Soil, sediment, and water sampling
- Installation of monitoring wells.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center, 400 East 10th Street, Anniston, Alabama. The telephone number is (256) 235- 5121. Directions to the hospital are provided in Figure 5-1.



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- HOSPITALS
- INVESTIGATION SITES

DRIVING DIRECTIONS FROM BALTZELL GATE ROAD TO THE NORTHEAST ALABAMA MEDICAL CENTER

- LEAVING FORT MCCELLELLAN ON BALTZELL GATE ROAD, TURN LEFT (SOUTH) ONTO AL HWY 21
- GO ~ 2.5 MILES WHERE AL HWY 21 MERGES WITH U.S. HWY 431 AND CONTINUE SOUTH
- CONTINUE SOUTH ON AL21/US431 FOR ~ 2.7 MILES
- TURN LEFT ONTO EAST 10th STREET
- GO ~ 0.2 MILE TO MEDICAL CENTER ON RIGHT
- PHONE NUMBER: (256)235-5121
- ADDRESS: 400 EAST 10TH STREET, ANNISTON, AL

FIGURE 5-1
HOSPITAL EMERGENCY ROUTE

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT MCCELLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

(Page 1 of 16)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Unexploded ordnance (UXO)	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See site-specific safety and health plans (SSHP) to determine if required.
	Slip, trip, and fall hazards	X Determine best access route before transporting equipment. X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards. X Look before you step; ensure safe and secure footing.
	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	X Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	X Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cuts/bruises	X Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	X Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellent. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Fire	X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

(Page 2 of 16)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow.
	Hazard communication	<ul style="list-style-type: none"> X Label all containers as to contents and dispose of properly. X Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	<ul style="list-style-type: none"> X Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	<ul style="list-style-type: none"> X Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	<ul style="list-style-type: none"> X Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. X Remove wet clothing promptly. X Take breaks in warm areas. X Reduce work periods as necessary. X Layer work clothing.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Heat rash	<ul style="list-style-type: none"> X Keep the skin clean and dry. X Change perspiration-soaked clothing, as necessary. X Bathe at end of work shift or day. X Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> X Drink plenty of cool fluids even when not thirsty. X Provide cool fluid for work crews. X Move victim to shaded, cool area.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Heat exhaustion	<ul style="list-style-type: none"> X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). X Set up work/rest periods. X Use the buddy system. X Allow workers time to acclimate. X Have ice packs available for use. X Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> X Evaluate possibility of night work. X Perform physiological monitoring on workers during breaks. X Wear body cooling devices.
	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow. X Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. X Barriers shall be used to protect workers from vehicular traffic. X Barriers shall be used to guard excavations adjacent to streets or roadways. X Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. X Heavy equipment shall have backup alarms.
	Forklift operations	<ul style="list-style-type: none"> X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	<ul style="list-style-type: none"> X Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. X Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. X Electrical tools shall be inspected daily prior to use.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Extension cords	<ul style="list-style-type: none"> X Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. X Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. X Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.). X Cords shall be designed for hard duty. X Cords shall be inspected daily.
	Lightning strikes	<ul style="list-style-type: none"> X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorm or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, fall	<ul style="list-style-type: none"> X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. X Provide adequate lighting in all work areas. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls. X Work areas will be kept clean and orderly. X Garbage and trash will be disposed of daily in approved refuse containers. X Tools and accessories will be properly maintained and stored. X Work areas and floors will be kept free of dirt, grease, and slippery materials.
	UXO	<ul style="list-style-type: none"> X UXO specialists will perform UXO surface clearance for UXO avoidance.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

(Page 5 of 16)

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	<ul style="list-style-type: none"> X Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. X If working adjacent to roadways, have workers wear fluorescent orange vests. X Use warning signs or lights to alert oncoming traffic. X Assign flag person(s) if necessary to direct local traffic. X Set up temporary parking locations outside the immediate work area. X Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. X Pedestrians have the right-of-way. X Wear seat belts when vehicles are in motion.
	Wildlife hazards	<ul style="list-style-type: none"> X Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	<ul style="list-style-type: none"> X Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	<ul style="list-style-type: none"> X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellent. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
Hydropunch sampling	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> X All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. X Equipment will be inspected before being put to use and at the beginning of each shift. X Faulty/unsafe equipment will be tagged and if possible locked out. X Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> X Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. X All mobile equipment and areas in which they are operated shall be adequately illuminated. X Whenever the equipment is parked, the parking brake shall be set. X Equipment parked on inclines will have the wheels chocked. X Inspect brakes and tire pressure on drill rig before staging for work. X Obtain trenching/drilling permit prior to operation.
	Inexperienced operator	<ul style="list-style-type: none"> X Machinery and mechanized equipment shall be operated only by designated personnel. X Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
	Jacks/outriggers	<ul style="list-style-type: none"> X Ensure proper footing and cribbing.
	UXO	<ul style="list-style-type: none"> X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Falling objects	<ul style="list-style-type: none"> X Remove unsecured tools and materials before raising or lowering the derrick. X Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert at all times!
	Fire	<ul style="list-style-type: none"> X Mechanized equipment shall be shut down prior to and during fueling operations. X Have fire extinguishers inspected and readily available.
	Fall hazards	<ul style="list-style-type: none"> X Personnel are not allowed to work off of machinery or use them as ladders. X Use fall protection when working above 6 feet.
	Noise	<ul style="list-style-type: none"> X Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	<ul style="list-style-type: none"> X Use machine guards; use long-handled shovels to remove auger cuttings. X Safe lockout procedures for maintenance work.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	X Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
Groundwater, sediment, and surface water sampling	Cross-contamination and contact with potentially contaminated materials	X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Avoid skin contact with water. X Handle samples with care. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Hazard communication	X MSDSs shall be obtained for chemicals brought on site. X Label all containers as to contents.
	Strains/sprains	X Use the proper tool for the job being performed. X Get assistance if needed. X Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Drowning	X Personal flotation devices will be worn when sampling on or adjacent to the water.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Groundwater, sediment, and surface water sampling (continued)	Spills/residual materials	X Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	X Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	X Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Avoid skin contact with paint. X Handle samples with care. X Only essential personnel will be in the work area. X All personnel will follow good hygiene practices.. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Slip, trip, and fall hazards	X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Bees, spiders, and snakes	X Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. X Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Cold stress	<ul style="list-style-type: none"> X Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. X Remove wet clothing promptly. X Take breaks in warm areas. X Reduce work periods as necessary. X Layer work clothing.
	Access/egress hazards	<ul style="list-style-type: none"> X Use qualified and trained bushhog operator. X Keep employees out of the bushhog work area. X Utilize good housekeeping practices. X Keep aisleways, pathways, and work areas free of obstruction. X Clean ice or snow off of walkways or work stations. X Use appropriate footwear for the task assigned.
	Heat rash	<ul style="list-style-type: none"> X Keep the skin clean and dry. X Change perspiration-soaked clothing, as necessary. X Bathe at end of work shift or day. X Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> X Drink plenty of cool fluids even when not thirsty. X Provide cool fluid for work crews. X Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none"> X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). X Set up work/rest periods. X Use the buddy system. X Allow workers time to acclimate. X Have ice packs available for use. X Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> X Evaluate possibility of night work. X Perform physiological monitoring on workers during breaks. X Wear body cooling devices.

Table 5-1
Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Lightning strikes	<ul style="list-style-type: none"> X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorms or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Installation of Monitoring Wells	Overhead hazards	<ul style="list-style-type: none"> • Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines.
	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> • All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. • Equipment will be inspected before being put to use and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and if possible locked out. • Drill rigs and geoprobes shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
	Heat rash	<ul style="list-style-type: none"> • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Comply with IT Procedure HS 400 (May 13, 1999). • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Comply with IT Procedure HS 400 (May 13, 1999). • Move victim to shaded, cool area.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Installation of Monitoring Wells (continued)	Heat exhaustion	<ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Comply with IT Procedure HS 400 (May 13, 1999). • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. • Comply with IT Procedure HS 400 (May 13, 1999).
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> • Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. • All mobile equipment and areas in which they are operated shall be adequately illuminated. • Aboveground and belowground utilities will be located prior to staging equipment. • Whenever the equipment is parked, the parking brake shall be set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig before staging for work.
	Inexperienced operator	<ul style="list-style-type: none"> • Machinery and mechanized equipment shall be operated only by designated personnel. • Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.
	Jacks/outriggers	<ul style="list-style-type: none"> • Ensure proper footing and cribbing.
	Falling objects	<ul style="list-style-type: none"> • Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> • Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times!
	Fire	<ul style="list-style-type: none"> • Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available. • Obtain a Hot Work Permit, per IT Procedure HS 314 (May 19, 1999) for any operation which could act as an ignition source.
	Fall hazards	<ul style="list-style-type: none"> • Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Installation of Monitoring Wells (continued)	Noise	<ul style="list-style-type: none"> Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine parts	<ul style="list-style-type: none"> Use machine guards; use long-handled shovels to remove auger cuttings. Safe lockout procedures for maintenance work.
	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Practice good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> Real time air monitoring will take place. Proper personal protective clothing and equipment will be utilized. Stop immediately at any sign of obstruction. Do not breathe air surrounding boring any more than necessary. Upgrade to respirator if necessary. Avoid skin contact with soil cuttings. Wear gloves. Stay clear of moving parts of drill rig and geoprobe.
	Drum handling	<ul style="list-style-type: none"> Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionization detector/flame ionization detector (PID/FID) equipment and upgrade to respirator if necessary. When filling a drum (with either soil or water), be careful not to make contact with the contained waste. Wear appropriate gloves. Make sure lid or bung of drum is secure. If moving a drum unassisted, be sure to leverage properly, use proper lifting techniques, and wear safety glasses and steel-toed boots. When using a drum dolly, make sure straps and lid catch are securely attached. Leverage properly when tilting drum. Be sure toes stay away from drum.
Moving and shipping collected samples	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cut hazards	X Wear adequate hand protection. Use care when handling glassware.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Moving and shipping collected samples (continued)	Hazard communication	X Label all containers as to contents and associated hazards.
	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	X Store in NO SMOKING AREA. X Fire extinguisher readily available. X Transfer only when properly grounded and bonded.
Surface Water/Sediment Sampling	Drowning	X Personnel will wear personal flotation devices when working on, over, or adjacent to water.
	Contact with contaminated materials	X Wear proper PPE when conducting sampling activities.
	Cross-contamination and contact with potentially contaminated materials	X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Slip, trip, fall	X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Surface Water/Sediment Sampling (continued)	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Bees, spiders, and snakes	X Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. X Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Access/egress hazards	X Use qualified and trained bushhog operator. X Keep employees out of the bushhog work area. X Utilize good housekeeping practices. X Keep aisleways, pathways, and work areas free of obstruction. X Clean ice or snow off of walkways or work stations. X Use appropriate footwear for the task assigned.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Disposal of investigation-derived waste (IDW) (Forklift Operation) (continued)	Cut hazards	<ul style="list-style-type: none"> X Use care when handling glassware. X Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	<ul style="list-style-type: none"> X Use proper lifting techniques. X Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> X Good housekeeping shall be implemented. X The work area shall be kept clean as feasible. <p>Inspect the work area for slip, trip, and fall hazards.</p>
	Fueling	<ul style="list-style-type: none"> X Only approved safety cans shall be used to store fuel. X Do not refuel equipment while it is operating. X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	<ul style="list-style-type: none"> X Equipment shall be inspected before being placed into service and at the beginning of each shift. X Preventive maintenance procedures recommended by the manufacturer shall be followed. X A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	<ul style="list-style-type: none"> X Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). X One standby person shall be available within the vicinity of the pump during jetting operation. X The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	<ul style="list-style-type: none"> X Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	<ul style="list-style-type: none"> X No machinery or equipment is permitted to run unattended. X Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.

Table 5-1

Activity Hazard Analysis
Training Area T-24A
Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Noise	X Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	X All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert and clear of materials suspended
	Falling objects	X Hard hats are required by site personnel. X Stay alert and clear of material suspended overhead.
	Flying debris	X Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	X All site personnel will wear the appropriate PPE.